UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,726	06/04/2001	Benedikt Ahlers	3197/BDR	4767

7590 08/20/2002

Rosenman & Colin LLP
575 Madison Avenue
New York, NY 10022-2585

EXAMINER	
ARTMAN, THOMAS R	
ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/873,726	AHLERS ET AL.	
	Examiner	Art Unit	
	Thomas R Artman	2882	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☒ Claim(s) 10,12-14 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: on page 4, lines 15-20, reference is made to the up-conversion effect, where "...the excitation wavelength is longer than the reflected wavelength emitted from the authenticity feature." The wavelength radiating from the feature is either reflected or emitted. Reflected light is light that originates from another source and bounces off of an object. Emitted light refers to light that originates from an object. If the light is fluorescing from the object, then it is emitted. This conflict of terms is confusing and does not clearly define the scope of the invention.

Appropriate correction is required.

Claim Objections

Claims 10 and 12 are objected to wherein there are parenthetical phrases that disclose pertinent information that further defines the scope of the invention. The parentheses must be removed for the content to be considered.

Claims 10 and 13-14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 10 states that the source is to operate in the UV range, and that the "...luminescence signal is detected in a different spectral band." This is in direct conflict with claim 5 (one of the parent claims of claim 10) which states that the signet fluoresces at the excitation wavelength. If this is so, then if the excitation wavelength is in the UV band, then the

fluorescence must also be in the UV band, and it cannot be "detected in a different spectral band." Claim 10 is contradictory to claim 5 and therefore does not further limit the scope of the invention.

In further regards to claim 10, in order to expedite the prosecution, the examiner will interpret claim 10 in the spirit of claim 5, such that, since the source is claimed as a UV source, then the fluorescence is in the UV band and can only be detected in that band. It shall be examined on these merits.

In regards to claims 13 and 14, both specify wavelength ranges within the IR band as the excitation wavelength. Claim 10 is one of the parent claims for both, which states that the excitation wavelength is in the UV band. Claims 13 and 14 are contradictory to claim 10 and therefore do not further limit the scope of the invention.

In order to expedite the prosecution of claims 13 and 14, the examiner will interpret claim 10 in the spirit of the applicant's specification corresponding to the preferred embodiment, and assume that the claimed source is an IR source.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Man (USPN 5,304,813) in view of Kaule (USPN 4,451,521).

In regards to claim 1, De Man has most of the structure of claim 1, including a sensor (Fig.1), where the signal is detected by a radiation receiver (item 4), with a focused beam from a beam source (item 9), converted by focusing optics (item 21') to create a scanning line in the approximate shape of a bar (Fig.2, item 8, covering entire width of note), and the signal passes through detection optics (Fig.1, items 21 and 4) to an evaluation unit (item 19). Though De Man depicts two sources in Fig.1, he discloses in the abstract that the region is "illuminated by at least one light line (9 or 10)." De Man does not specifically disclose a signet as a detection feature on a document that fluoresces when irradiated with the source wavelength, however, in col.4, lines 51-61, that documents have been known to use materials "in the printed pattern, in the paper fibers, etc." that fluoresce when exposed to radiation. Kaule also teaches the use of mixing fluorescing materials in inks used on parts of a document. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use fluorescing materials for security measures on secure documents. It has long been recognized in the art to use fluorescing materials for prohibiting forgery of documents, with disclosures of such technology in German patents dating from the mid 1920s (Kaule, col.2, lines 23-31) that fluoresce in the visible spectrum when irradiated with UV light. Such anti-counterfeiting dies offer reliable detection methods and are not easy to fake.

With respect to claim 2, De Man's longitudinal axis of illumination is not at approximate right angles to the document being tested as shown in Fig.1. De Man does disclose, however, the importance of illumination angle. Depending upon the specific needs of the sensing portions of the device, the angle of illumination is crucial for proper functionality and improved accuracy (De Man, col.3, lines 22-32). The inferred range of angle θ, based upon Fig.1, includes a

position approximately at right angles to the document surface. Also, Kaule's device illuminates a document (Fig.1, item 1) from a source (item 3) at right angles to the document. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to illuminate the document at approximately right angles to the surface. Furthermore, the applicant does not provide any explanation as to the critical nature of the claimed illumination angle.

With regards to claim 3, Kaule teaches the precedence of pigments that can be detected using the "up-conversion" effect, where the fluorescent wavelength is shorter (the frequency is higher) than the excitation wavelength. In col.2, lines 40-47, Kaule states that such pigments, illuminated in the IR range and fluoresce in the visible, for example, have existed for some time for testing documents for genuineness. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement such pigments in a document for forgery detection. Furthermore, the applicant does not disclose any criticality for the use of this type of fluorescent pigments.

In regards to claim 4, as stated above against claim 1, De Man does mention, in col.4, lines 51-61, that pigments have been used that fluoresce in the visible spectrum when irradiated with UV light, which would be using the "down-conversion" effect, where the fluorescent wavelength is longer (the frequency is lower) than the excitation wavelength. Kaule also teaches the precedence of such pigments. In col.2, lines 29-31, Kaule states that such pigments, illuminated in the UV range and fluoresce in the visible, for example, have existed for some time for testing documents for genuineness. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement such pigments in a document for

forgery detection. Furthermore, the applicant does not disclose any criticality for the use of this type of fluorescent pigments.

With respect to claim 5, Kaule teaches that such pigments do exist and are known for use as security measures on documents, for example, starting in col.4, line 63, to fluoresce in the UV range when excited with UV light, and as another example, starting in col.5, line 55, to fluoresce in the IR range when excited with IR light. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement such pigments in a document for forgery detection. Furthermore, the applicant does not disclose any criticality for the use of this type of fluorescent pigments.

In regards to claim 6, it would be readily recognized by one skilled in the art that there is an inherent delay, admittedly small, but measurable, between the excitation pulse and the reactionary, or fluorescent, pulse as the material reacts to the stimulation. Such reaction delays occur in any physical system.

With respect to claim 7, it would be readily recognized by one skilled in the art that the pigments would be added to an applied solution, paint, adhesive, or paper. De Man states in col.4, lines 51-61, that documents are known for having dyes mixed with printing ink or paper fibers, etc., that fluoresce when exposed to radiation. Kaule also teaches, in col.3, line 5, that luminous pigments are often mixed as an additive with the paper, or in line 7, as printing inks (a.k.a. "paint"). In this way, the indicator pigments are present throughout the documents or at least dispersed through a portion of the document, such that testing would be efficient and reliable for automation, and it would be difficult to fake. Therefore, it would have been obvious

to one of ordinary skill in the art at the time the invention was made to include the pigments in applied solutions, paint or mixed with the paper material.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Man and Kaule and in further view of Voser (USPN 6,172,745).

De Man and Kaule have the structure as described above against claims 1 and 5-7. Neither reference discloses or teaches of a position sensor for "position-resolved detection." Voser, in col.7, lines 43-48, describes the use of such a detector (Fig.3, item 72) in his sensing device. The sensor is used to detect the presence of a bank note and it's orientation along the transport direction such that the sensing elements will have information on the document's position for proper timing of illumination. Also, the pattern recognition circuitry would be able to better match the stored reference patterns to the detected pattern. All of this would result in improved accuracy. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include position detectors for proper timing of the devices and more accurate pattern recognition.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Man, Kaule and Voser, and in further view of Hopwood (USPN 5,915,518).

With respect to claim 9, the structure as described against claim 8 applies and the following: The previous references do not disclose sensors that detect two different spectral bands with one illumination. Hopwood teaches the use of a detection means (Fig.1) that illuminates a document with UV light and detects the reflected UV and the fluorescence, which occurs in a different band than UV. In col.2, lines 35-45, Hopwood states that detecting the reflected and fluorescing light allows for improved accuracy for the detection of fraudulent bank

notes because the reflectivity properties in the UV band can vary as well as the fluorescence. However, if one of the results (such as UV reflectance) is similar between a counterfeit and genuine document, the other (fluorescence) is different, and vise-versa. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to detect multiple spectral bands with one illumination source for improved accuracy of detecting fraudulent documents using fluorescing pigments.

In regards to claim 10, Hopwood uses a UV light source, and specifies a range of 300-400nm (col.2, lines 37-38), where the reflectivities vary between genuine and counterfeit documents when illuminated in this range. This allows another avenue for fraud detection as described against claim 9. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a UV light source for the detection of fraudulent documents using fluorescing pigments.

With regards to claim 11, Voser's sensor as described against claim 8 is used for the exact purpose of sensing the beginning, end and position of a bank note relative to the transport path. In this way, the illumination and detection optics will be better timed for sampling images of the document for pattern recognition, and the length of the document can be measured as an additional security feature as taught by Voser. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include position detectors for more accurate detection of fraudulent documents.

Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Man, Kaule, Voser and Hopwood, and in further view of Laskowski (USPN 5,923,413).

With respect to claim 12, it states that "pigments having a fast rise time and a fast decay time are used." First, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use such pigments. The quick rise and decay times are helpful for automated testing to be fast. As described in Laskowski, in col.7, lines 18-22, speeds as high as 15 US bank notes per second are to be achieved in a bank note discriminator. For example, a bank would need to process as much as several thousand bank notes per week. The use of fluorescing pigments for document verification is quite useful in that the testing is reliable and difficult to fake, as described above against previous claims. Therefore, it would be obvious to one skilled in the art to use fluorescing pigments for automated document verification.

Second, pigments "having a fast rise time and a fast decay time" are, by definition, fluorescing pigments as already claimed in claim 5, where the signet, a fluorescent authenticity feature, uses pigments. It would be obvious by one skilled in the art that fluorescing materials have fast rise and decay times by definition, compared to phosphorescing materials, which have much longer decay times as stated in Merriam-Webster's Collegiate Dictionary, 10th ed. "Fluorescence...luminescence that is caused by the absorption of radiation at one wavelength followed by nearly immediate re-radiation usu. at a different wavelength and that ceases almost at once when the incident radiation stops...compare PHOSPHORESCENCE."

With respect to claims 13 and 14, the structure as applied against claim 12 applied here and the following. Both claim specific, narrow wavelength ranges within the IR band. Voser and Laskowski, among others, use various wavelengths in the IR band. It would be appreciated by one skilled in the art that, not only is the IR band useful in fraudulent document detection, but also using a wide range of IR wavelengths, like that of Voser's scanning head that uses four IR

wavelengths, would improve accuracy and allow for flexibility with different fluorescing pigments. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use IR radiation for such an application. Also, though the applicant specifies that these wavelength ranges are preferred, a specific reason, such as a new pigment being used or an unexpected result being obtained, is not disclosed.

Regarding claim 15, the structure as applied against claim 14 applies here and the following. A typical light source, such as an LED or laser diode, is essentially a point source with light radiating outward, or diverging. It would be appreciated by one skilled in the art that, when divergent light is incident upon a cylindrical lens, a bar-shaped beam will result such that the center will have the highest intensity and the outer ends of the light beam will have the lowest intensity. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use cylindrical lenses to focus a light beam into the shape of a bar, and the intensity would naturally be highest in the middle.

With respect to claims 16 and 17, the structure as applied against claim 15 applies here and the following. Both claims define variations on the shape of the surface of the cylindrical lens of claim 15 (claim 16 is aspherical, claim 17 is sinusoidal). These shapes perform the same function and are considered functional equivalent substitutions that would have been obvious to one skilled in the art at the time the invention was made.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Man, Kaule, Voser, Hopwood and Laskowski, and in further view of Schwartz (US 6,371,374).

In regards to claim 18, the structure as applied against claim 15 above applies here and the following. Schwartz uses an array of cylindrical lenses (Fig.2, item 67) to improve the

intensity at the outer edges of the bar-shaped beam such that the barcode scanner would accurately decipher the outlying lines of long bar codes. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the intensity at the edges of a laser line for improving the detection capabilities of the device for detecting signets near the ends of the bar-shaped light beam.

Claims 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Man, Kaule, Voser, Hopwood, Laskowski and Schwartz, and in further view of Cherney (USPG-PUB 2001/0006066).

With respect to claim 19, the structure as applied against claim 18 above applies here and the following. Cherney discloses a reflective cone based upon total internal reflection for concentrating light from the sun onto a solar cell. In this way, the cell is more efficient in that the higher intensity corresponds to higher output. Also, Voser teaches the advantages of a metal coating on a light guide to improve containment of the light and the rejection of any ambient light contaminating the excitation wavelengths. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a cone-shaped reflector that is either transparent or metal-coated for increasing the intensity of the fluorescing light in order to improve the performance of the sensor. The higher the intensity is, the more precise the device will be for detecting and identifying specific wavelengths.

In regards to claim 20, the structure as described against claim 19 applied here and the following. Photomultipliers are common devices for light detection that further intensify the signal for accuracy, and therefore it would have been obvious to one skilled in the art at the time the invention was made to use them for detecting fluorescing light from a signet.

With regards to claim 21, the structure as described above against claim 20 above applied here and the following. Voser discloses the practice of detecting specific regions of a bank note and the use of lenses (Fig.1, item 20) to focus that portion of light on a respective photodetector (item 12). In this way, a higher degree of accuracy can be achieved for fraud detection such that many parts of the bank note are analyzed separately. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide for imaging portions of a scanning line to better locate and identify the signet.

With respect to claim 22, the structure as described against claim 21 above applies here and the following. Voser's array of lenses and corresponding photodetectors are arranged along the line of illumination close to the bank note for the simple reason that the light to be detected is going to originate from that region. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to stack such assemblies in an array along the illumination line such that the fluorescent light can be detected.

Regarding claim 23, the structure as described against claim 21 above applies here and the following. Adding a reflecting cone behind each lens to further direct light to the corresponding photodetector is a rearrangement of parts that would have been obvious to one of ordinary skill in the art at the time the invention was made. To use one reflective cone on a detector or to use several cones on corresponding detectors is equivalent and obvious to do so.

With respect to claim 24, the structure as applied against claim 23 above applies here and the following. Beam splitters are common in the art of optical devices, such as in interferometers, spectrometers, etc. The use of a beam splitter is merely a rerouting of the light

paths without any reason or advantage to do so, and therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Herbert (US 6,101,038) describes the specific structure of a lens and reflecting cone combination; Lee (US 5,991,045) describes a hollow metal reflecting cone.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 4:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

August 5, 2002

ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800